

Amendments to the Claims

Please amend the claims pursuant to the following listing. This listing of claims will replace all prior versions of claims and listings of claims in the reissue application:

1. A method for harvesting bone through a guided delivery instrumentation system which operates through a percutaneous, laparoscopic, minimally-invasive technique, comprising the steps of:
 - making a small incision above a harvest site;
 - inserting an elongated guide wire with a blunt proximal end and a pointed distal end into the incision, distal end first, to a bone area to be harvested;
 - gently impacting the guide wire proximal end whereby the guide wire distal end enters into said bone area in the harvest site;
 - placing a cylindrical obturator with a generally cylindrical channel centrally formed within said obturator along its central longitudinal axis concentrically over the guide wire;
 - guiding the obturator onto to the guide wire toward the guide wire distal end whereby the obturator gradually splits muscle and tissue until it contacts said bone;
 - placing a first, hollow, cylindrical dilator concentrically over said obturator thereby increasing said incision to a percutaneous approach;
 - removing said guide wire and obturator;
 - placing an impactor cap over said first dilator;

gently tapping said first dilator with impactor cap into said harvest site bone;
inserting an elongated, hollow, cutting cylinder, said cutting cylinder having a handle on a proximal end and a hollow and a cutting tip on a distal end, into said first dilator whereby said cutting tip is brought into engagement with said bone;
cutting a portion of said bone with said cutting tip and bringing said cut portion through the hollow cutting tip into the cutting cylinder;
removing the cutting cylinder and cutter tip from the first dilator;
removing the handle from said cutter cylinder;
removing the cut bone from the cutter cylinder;
removing the first dilator from said harvest site; and
closing the incision.

2. A method for harvesting bone as described in claim 1, further comprising the step of:

placing a second, hollow, cylindrical dilator concentrically over said first dilator.

3. A method for harvesting bone as described in claim 2, further comprising the step of:

placing a third, hollow, cylindrical dilator concentrically over said second dilator.

4. A method for harvesting bone as described in claim 1, further comprising the steps of:

placing a hollow, cylindrical cannula having a proximal end and distal end, said distal end being longitudinally notched resulting in two protruding arms parallel to the central axis of said cannula, concentrically over said dilator whereby said cannula distal end engages the bone area;

placing an impactor cap over said cannula; and

gently tapping said cannula with [impact] impactor cap into said bone area.

5. A method for harvesting bone as recited in claim 4, further comprising the step of:

placing a second, hollow, cylindrical dilator concentrically over said first dilator.

6. A method for harvesting bone as recited in claim 5, further comprising the step of:

placing a third, hollow, cylindrical dilator concentrically over said second dilator.

7. A method for harvesting bone as recited in claim 4, further comprising the steps of:

removing said dilator prior to insertion of said cutter cylinder; and

inserting said cutting cylinder into said cannula.

8. A bone harvesting apparatus for the removal of bone material from a living body, comprising:

a guided delivery system, comprising:

an elongated guide wire having a pointed distal end and a blunt proximal end, said distal end being adapted to engage a bone from which bone material is to be extracted;

a generally cylindrical obturator with an internal, hollow channel formed along an elongated central axis and positioned concentrically over said guide wire, said obturator having a generally dome-shaped distal end adapted to dividing tissue abutting said bone, and a proximal end with gripping means;

a generally cylindrical, hollow, open-ended dilator concentrically positioned over said obturator; and

a generally cylindrical, hollow, open-ended, forked cannula concentrically positioned over said dilator; and

a coring device within said delivery system for extracting precise amounts of bone material.

9. A bone harvesting apparatus as recited in claim 8, wherein said guided delivery system is further comprised of:

a plurality of generally cylindrical, hollow, open-ended dilators concentrically positioned over said obturator.

10. A bone harvesting apparatus as recited in claim 8, wherein:
said dilator has a proximal end and a beveled distal end with teeth protruding therefrom.

11. A bone harvesting apparatus as recited in claim 10, wherein said coring device is comprised of:
a cutter cylinder having a proximal end and a distal end interconnected by a hollow tube;
a hollow cutting tip attached to said cutter cylinder distal end;
a handle joined to said cutter cylinder proximal end; wherein said cutter cylinder and cutting tip are adapted to fitting within said dilator.

12. A bone harvesting apparatus as recited in claim 10, wherein:
said forked cannula has a proximal end terminating in two parallel, block-like elements, and a distal end longitudinally notched resulting in two longitudinally protruding arms parallel to a central, longitudinal cannula axis.

13. A bone harvesting apparatus as recited in claim 12, wherein said coring device is comprised of:
a cutter cylinder having a proximal end and a distal end interconnected by a hollow tube;
a hollow cutting tip attached to said cutter cylinder distal end;
a handle joined to said cutter cylinder proximal end;

wherein said cutter cylinder and cutting tip are adapted to fitting within said dilator.

14. A bone harvesting apparatus as recited in claim 11, wherein:
said cutting tip has a proximal end joined to the cutter cylinder distal end and a distal end having two, protruding, generally triangular flat blades, each having two lateral sides and a distal tip, said distal tips being connected to each other, each said blade lateral side being formed into a cutting edge, said cutting tip distal end also terminating in two cutting edges positioned between said protruding blades.

15. A bone harvesting apparatus as recited in claim 13, wherein:
said cutting tip has a proximal end joined to the cutter cylinder distal end and a distal end having two, protruding, generally triangular flat blades, each having two lateral sides and a distal tip, said distal tips being connected to each other, each said blade lateral side being formed into a cutting edge, said cutting tip distal end also terminating in two cutting edges positioned between said protruding blades.

16. A method of harvesting bone, the method comprising:
inserting a guidance member through a percutaneous incision to a bone, at a bone
harvest site;

sequentially inserting at least one member of a set of dilation channels through the incision with a first dilation channel of the set having been positioned over the guidance member;
inserting a cutter device through the member of the set of dilation channels to engage the bone harvest site; and
cutting the bone with the cutter device to bring a portion of the bone into the cutter device's interior.

17. A method according to claim 16, the method further comprising:
making a percutaneous incision, that is at most 2 centimeters in length, above the bone harvest site.

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

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23. (Canceled)

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25. (Canceled)

26. (Canceled)

27. (Canceled)

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29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. A method of harvesting bone, the method comprising:

creating a conduit from a patient's skin to a bone harvest site through a small

incision in the patient's skin;

expanding the diameter of the conduit by inserting, into the small incision, a

dilation channel;

inserting a cutter device, comprising a hollow collection shaft, into the small

incision; and

expanding the diameter of the conduit by inserting a plurality of dilation channels of sequentially increasing size.

34. A method of harvesting bone, the method comprising:

inserting a hollow cylindrical coring device, comprising a permanently attached cutting tip, through a guided delivery system to engage a bone harvest site;

and

directing a downward force on the coring device, the downward force engaging a downward-facing cutting edge against the bone harvest site, the downward-facing cutting edge extending in a circumferential direction with respect to a circle in a plane perpendicular to a longitudinal axis defined by a shaft of the coring device,

wherein the downward-facing cutting edge extends circumferentially around less than a full circle.

35. A method according to claim 34, wherein the hollow cylindrical coring device is inserted through a percutaneous incision.

36. A method according to claim 34, wherein the cutting tip is bonded to the coring device.

37. A method according to claim 34, wherein the cutting tip is mechanically fastened to the coring device.

38. A method according to claim 34, wherein the cutting tip is ultrasonically welded to the coring device.

39. (Canceled)

40. (Canceled)

41. (Canceled)

42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (new) A method of harvesting bone comprising:

providing a coring device for harvesting bone, the coring device comprising:

a hollow cylindrical shaft defining a longitudinal axis; and

a cutting tip permanently attached to the shaft, the cutting tip being configured to permit harvested bone to pass into the hollow cylindrical shaft and including:

two protruding blades joined at one end, each protruding blade comprising a counterclockwise cutting edge and a clockwise cutting edge; and

two downward-facing cutting edges, each extending in a circumferential direction with respect to a circle in a plane perpendicular to the shaft's longitudinal axis; and
cutting the bone with the coring device.

46. (new) A method according to claim 45, wherein the cutting tip is provided with two support blades, each support blade comprising a counterclockwise cutting edge and a clockwise cutting edge and extending between a support section of the cutting tip and one of the protruding blades.

47. (new) A method according to claim 45, wherein the two protruding blades are provided at a 45° angle to the shaft's longitudinal axis.

48. (new) A method according to claim 45, wherein the cutting tip is bonded to the hollow cylindrical shaft.

49. (new) A method according to claim 45, wherein the cutting tip is mechanically fastened to the hollow cylindrical shaft.

50. (new) A method according to claim 45, wherein the cutting tip is ultrasonically welded to the hollow cylindrical shaft.

51. (new) A method for harvesting bone including:
providing a cutter-and-collection apparatus, the apparatus comprising a collection shaft and a stainless steel cutting tip permanently attached to the collection shaft, the cutting tip comprising an opening adapted to allow cut bone chips to move into the collection shaft's interior and a protruding blade;

and cutting the bone with the apparatus to bring a portion of the bone into the apparatus's interior.

52. (new) A method according to claim 51, wherein the cutting tip is provided with a plurality of openings.

53. (new) A method according to claim 52, wherein the cutting tip is provided with two cutting blades.

54. (new) A method according to claim 53, wherein the cutting blades are provided with cutting edges on both sides.

55. (new) A method according to claim 51, wherein the cutting tip is provided with two cutting blades.

56. (new) A method according to claim 55, wherein the cutting blades are provided with cutting edges on both sides.

57. (new) A method according to claim 51, wherein the cutting blade is provided with cutting edges on both sides.

58. (new) A method for harvesting bone including:
providing a cutter-and-collection apparatus, the apparatus comprising a collection shaft and a stainless steel cutting tip attached to the collection shaft, the cutting tip comprising an opening adapted to allow cut bone chips to move into the collection shaft's interior and a protruding blade, wherein the protruding blade is provided with cutting edges on both sides;

and cutting the bone with the apparatus, by pushing the apparatus into the bone and alternately turning it in clockwise and counterclockwise directions, to bring a portion of the bone into the apparatus's interior.

59. (new) A method according to claim 58, wherein the cutting tip is provided with a plurality of openings.

60. (new) A method according to claim 59, wherein the cutting tip is provided with two protruding blades, each of which is provided with cutting edges on both sides.

61. (new) A method according to claim 58, wherein the cutting tip is provided with two protruding blades, each of which is provided with cutting edges on both sides.